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Poster Sessions

Effects of Sphingosine-1-phosphate on brain pericytes regulating blood-brain barrier functions.

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Blood-brain barrier (BBB) functions are maintained by cross-talk between brain capillary endothelial cells and elements of the neurovascular unit. Brain pericytes have crucial roles to maintain the BBB functions. Sphingosine-1-phosphate (S1P) is known as the regulator of many biological processes. The aim of the present study was to examine the role of S1P as interaction factors between endothelial cells and pericytes. To examine the effects of S1P on barrier functions, we made two kinds of in vitro BBB models, endothelial cells monolayer model and endothelium-pericytes co-cultured model. Barrier functions were assessed by measuring TEER and permeability of sodium fluorescein (NaF). S1P treatment decreased the TEER value and increased the NaF-permeability on endothelial monolayer model. The S1P-induced barrier dysfunctions were worsened by the presence of pericytes. To examine whether S1P affects the production of secreted factors from pericytes, real-time PCR was performed. S1P increased the several mRNA expression related to inflammation. These data indicate that secreted factors from pericytes stimulated by exogenous S1P worsen the BBB functions, and S1P act as the interplay factors in blood-brain barrier.